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NSF FUNDS NANO-RELATED COURSEWORK FOR GRADES 7-12

By Jeff Karoub
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Sept. 27, 2004 - The National Science Foundation (NSF) has awarded a first-of-its-kind grant to a Northwestern University-led team to train teachers in nanotechnology and help them develop programs for middle and high schools.

"This is different from previous (NSF-funded) centers, which focus on research but have also done part-time outreach activity," said Mike Roco, senior nanotech adviser at NSF and an architect of the National Nanotechnology Initiative.

NSF this week is expected to officially announce the five-year, \$15-million award to Robert Chang, a professor in Northwestern's Department of Materials Science and Engineering. He is the lead investigator on the proposal selected for the Nanotechnology Center for Learning and Teaching, in partnership with Purdue University, University of Michigan, and the University of Illinois campuses in Chicago and Urbana-Champaign.

The goal, government officials say, is to create an information clearinghouse that not only develops new materials for schools, but also trains teachers through specific doctorate programs and short-term courses so they can introduce nanoscale science and engineering to students in grades 7-12. They believe it's the first nano-related program of its kind to serve that group.

"Our main goal was, first of all, to bring the excitement of science and nanotech earlier as a unifying approach for other disciplines," said Roco. "Secondly, we tried to develop the pipeline needed for future nanotech workers in the U.S. ... We have outstanding research, but don't have nanotech workers to do this."

Roco said Chang has experience working with middle and high schools during the past decade by leading the NSF-supported Materials World Modules program, which produces content based on topics in materials science. The effort has created connections across disciplines, including biology, chemistry, physics and engineering.

Northwestern's proposal is "not focused on a few top universities," according to Roco, who said it provides in-kind support and seeks input from other institutions, such as the U.S. Military Academy West Point and Argonne National Laboratory. The proposal is also working with colleges and universities with a high number of minority students including Morehouse College, University of Texas at El Paso, Hampton College, Fisk University, and Alabama A&M University.

Chang said he envisions a program that will provide professional training and degree programs, as well as a Web-based network where students can perform visualization, simulation and remote-control of nano equipment. Plans also include an online library of course content and research galleries.

Although the program will be much broader and the interactions more complex than the Materials



Photo by Roberto Borea

Mike Roco, senior nanotech adviser at NSF, said the program is different from previous NSF-funded centers that focus on research.

World Modules, Chang said the new center will still be based on the same ideas.

"Our approach with our content is to relay concepts into relevant daily activities, which includes design of products," he said. "This is the biggest challenge of my life ... because this program supposed to ... improve science education in the U.S. That's the bottom line."

The center's model serves as a foundation for several others in the works: nanotechnology in society, hierarchical nanomanufacturing and science museums. All seek to share information with other centers, academic institutions and even the general public.

"The idea to have a broader impact than on a single school or single region," Roco said. "The new concept is more than information; it's making available the results."